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ABSTRACT:

CHG DATE=19990617 STATUS=O> The seat has a frame (16) which extends between the floor (20) of a vehicle in which it is mounted and the backrest (14) of a seat (10) of the vehicle. A seat shell (34) is slidable on curved portions (22) of side rails (17) of the frame and can be secured in a desired position by engagement of a spring-loaded bolt (44) at each side of the seat in one of a series of apertures (30) in each side rail (17). In addition to the rearwardly-facing reclined position of Figure 2, the shell can adopt

reclined and upright forwardly-facing positions. The seat can also be converted into a pram. Figures 8 to 12 show a second child's safety seat, in which the shell (110) is attached to side rails (101) by two connections (120, 121) only at each side.



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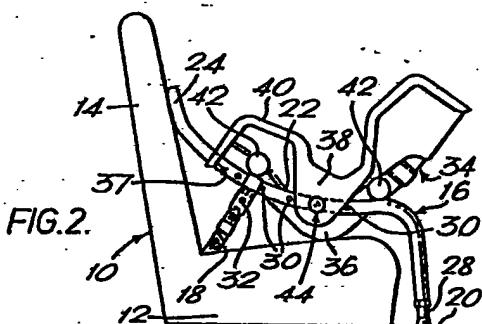
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(54) Child's safety seats.

(57) The seat has a frame (16) which extends between the floor (20) of a vehicle in which it is mounted and the backrest (14) of a seat (10) of the vehicle. A seat shell (34) is slidably on curved portions (22) of side rails (17) of the frame and can be secured in a desired position by engagement of a spring-loaded bolt (44) at each side of the seat in one of a series of apertures (30) in each side rail (17). In addition to the rearwardly-facing reclined position of Figure 2, the shell can adopt reclined and upright forwardly-facing positions (Figures 3 and 4). The seat can also be converted into a pram (Figure 7). Figures 8 to 12 show a second child's safety seat, in which the shell (110) is attached to side rails (101) by two connections (120, 121) only at each side.



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CHILD'S SAFETY SEATS

DESCRIPTION

This invention relates to child's safety seats for use in vehicles, for example, motor vehicles.

5 Known child's safety seats have tended to be rather inversatile and, in particular, not suitable for use by babies and very small children whose body structure cannot withstand loads imparted by a conventional safety harness. Moreover, known seats have tended to be
10 inconvenient to secure in and remove from a vehicle and limited in application to vehicles only.

In a first aspect, the present invention provides a child's safety seat comprising a seat structure, conveniently a one-piece shell, means for supporting the seat structure in a vehicle, and means for securing the safety seat in the vehicle, the support means being shaped such that, when the safety seat is secured in a vehicle, first and second spaced-apart end portions of the support means contact respectively the backrest of
20 the vehicle seat and the vehicle floor adjacent the seat, the seat structure being mountable on an intermediate portion of the support means which lies between the end portions and, when the safety seat is secured in a vehicle, extends over the squab of the vehicle seat.

25 Preferably the seat structure is adjustably mounted on the support means and, advantageously, the mounting

is such that the orientation of the seat structure relative to the support means is selectively adjustable. The possible relative orientations of the seat structure and the support means advantageously include a first, 5 forward facing position in which a child occupying the seat faces generally away from the backrest of the vehicle seat and a second, backward-facing position in which the child faces generally towards the backrest.

The inclination of the seat structure relative to 10 the support means is preferably selectively adjustable and the relative inclinations attainable may include a reclined position in which the back of the head of a child occupying the seat is supported by the seat structure.

15 The combination of a reclined and a backward-facing position is particularly advantageous since, in this position, a baby or very small child (for example one weighing less than 20lb or 9kg) can safely occupy the seat structure which can be reclined sufficiently to form a cradle-like support for the baby 20 or child. In the event of a sudden acceleration or deceleration of the vehicle in which the safety seat is secured, the resulting loads on the baby's or child's body act on its back which is the strongest part of the 25 body of very small children. The seat of the present invention can thus be used to carry babies and very small children whose body structures are incapable of resisting crash loads imparted through a safety harness such as is suitable for larger children, for whom the 30 seat of the invention can be fitted with a safety harness and preferably used with the seat structure in a forward-facing position relative to the support means. Accordingly, the invention provides a safety seat which can be used for a child throughout its growing-up from 35 a baby onwards. The shape of the support means also

helps to ensure _____
stability of the safety seat in the event of an accident
and reduces the risk of tipping movement of the safety
seat taking place.

The support means is preferably shaped such

5 that the intermediate portion of the support means is inclined to the horizontal when the support is secured in a vehicle. The relative positions of the seat structure and support means can then include a raised position, in which a child in the seat can easily see

10 out of a vehicle, and a lower, more reclined position suited to a sleepy or sleeping child. Preferably, the intermediate portion is curved, the seat structure is movable along the intermediate portion, conveniently on wheels or other rotary elements, and the safety

15 seat includes means for engagement of the seat structure with the support means in a selected position relative to the intermediate portion. Conveniently, the engagement means allow engagement of the seat structure with the support means at a

20 selected one of a plurality of predetermined positions.

The support means of the child's safety seat conveniently comprise first and second laterally-spaced side members engagable with respective opposite sides of the seat structure and joined by

25 one or more transverse members. The ends of the side members constituting the end portion of the support means contacting the vehicle floor advantageously have respective adjustable elements to facilitate securing of the safety seat in a range of vehicles

30 and on a range of vehicle seats.

The end portion of the support means which contacts the vehicle floor advantageously comprises energy-absorbing elements which absorb loads on the child's seat in the event of an impact of or upon the

vehicle. These energy-absorbing elements may be combined with or be constituted by the adjustable elements mentioned above.

When the support means comprises the spaced side members mentioned above, the engagement means are conveniently constituted by a respective series of spaced apertures on each side member, the seat structure having a spring-loaded bolt at each side for reception in a selected aperture in the adjacent side member.

The securing means of the safety seat preferably comprise an anchoring strap or assembly of straps positioned at each side of the support means for securement to the vehicle in a region adjacent the join of the vehicle seat squab and backrest. Thus, the anchoring straps or strap assemblies can be secured to the seat belt anchorages conventionally provided in the said regions of the front and back seats of motor vehicles.

In a second aspect, the present invention provides a child's safety seat which is adaptable to use as a child's pram.

The safety seat may comprise a seat structure, preferably a one-piece shell, support means for supporting the seat structure in a vehicle, means for securing the safety seat in a vehicle and a plurality of rotary elements, preferably comprising wheels, having means for removable attachment to the support means or seat structure for formation of a pram incorporating the seat structure.

Thus, formation of a pram may take place by removable attachment of wheels to the support means or, otherwise, by removable attachment of wheels

to the seat structure. In this latter case, the attachment means may comprise further frame means removably attachable to the seat structure.

The safety seat may also include handle
5 means, preferably arranged for removable attachment
to the support means or seat structure, to facilitate
pushing, pulling and steering of the seat when in
use as a pram.

Advantageously, the child's safety seat
10 of the first aspect of the present invention is capable
of adaption into a child's pram and, for this purpose,
that child's safety seat invention has demountable
wheels and, preferably, one or more demountable handles
by which the pram can be pushed, pulled and steered.

15 One or more demountable front wheels are
preferably fitted adjacent the second end portion
of the support means, conveniently as replacements
for the adjustable or energy-absorbing elements if
these are provided.

20 One or more rear wheels of the pram,
preferably fitted to the ends of respective struts,
may be removably attachable to the support means
adjacent its first end portion. One or more demountable
handles are preferably also secured adjacent the first
25 end portion.

Advantageously, each rear wheel strut and
a handle are combined into a single elongate strut
member having a rear wheel at one end and a handle
portion at its other end, two such elongate members
30 being attachable to the support means at laterally-
spaced positions adjacent the first end portion.

The wheels are conveniently castors but other
wheels or rotary elements may also be used.

When the safety seat of the invention is used as a pram, the seat structure may be mounted on the support means in either a forward-facing position or a rearward-facing position.

5 In a third aspect, the present invention provides a child's safety seat comprising a seat structure, preferably a one-piece shell, means for supporting the seat structure in a vehicle, and means for securing the safety seat in a vehicle, the seat
10 structure being mountable on the support means in first and second alternative positions in which the seat structure is in forwardly- and rearwardly-facing positions.

The rearwardly-facing position is preferably
15 a reclined position and the advantages of such a combination of positions mentioned above are thereby attained.

The safety seat is thus adaptable and can be used for a child throughout a growing-up period.
20 The seat is also advantageous in that the support means can be left permanently installed in a vehicle and the seat structure mounted on it when required. The support means preferably take the form of the support means of the seat of the first aspect of this
25 invention and the seat of this third aspect may then have any or all of the optional features mentioned above.

According to a fourth aspect of the present invention, there is provided a child's safety seat comprising a seat structure, preferably a one-piece shell, a support frame for supporting the seat structure in a vehicle, the support frame comprising first and second spaced-apart side portions on which the seat

is supported for movement thereon between an upright and an inclined position, means for securing the safety seat in a vehicle, and means for securing the seat structure to the frame at a selected relative position of the structure and frame, the seat structure having two attachment points only with each frame side portion.

5 With such an arrangement, the seat structure is particularly easily moved relative to the frame and, unlike a seat in which the seat structure is
10 attached to each frame side portion at several points or over a continuous contact region, the ease of adjustability of the seat structure is not impaired by departures of the shape of the frame from its original or ideal shape.

15 Preferably, the securing means are located at at least one of the attachment points and more preferably comprise at least one guide element on the seat structure and having a bore in which a frame side portion is slidably received and a securing element
20 having a stem which is receivable in a selected one of a plurality of apertures in the frame side portion and which can be inserted into and secured in a socket opening laterally into the bore in such a way that the stem is received in an aperture aligned with the
25 socket and the seat structure is thus secured to the frame.

Advantageously, each frame side portion has a lower, preferably rectilinear, forwardly- and downwardly-inclined ramp portion and an upper, 30 preferably rectilinear, upright portion, each attachment point lying on a different one of the lower and upper frame portions.

Thus, in its uppermost position, the upper

region of the seat structure is at the upper end of the upright guide portion and the lower region is at its lower end, or at the upper end of the inclined portion. Downward movement of the seat structure 5 upper region is accompanied by movement, of the lower region guided by the inclined guide portion, both forwardly and downwardly, so that as the seat structure tilts into a reclining position, it is also lowered as a whole.

10 In preferred embodiments, each frame side portion has upper and lower free ends, the upper free end preferably forming the free end of a looped portion for reception over the upper edge of a vehicle seat backrest and the lower free end preferably forming 15 a free end of a side frame portion intended for contact with a vehicle seat squab and extending beneath a respective one of the ramp portions.

Thus, the invention can provide safety seats having frames which are particularly simple to construct 20 and economical in use of materials.

Embodiments of the invention will now be described by way of example with reference to the drawings, in which:

Figure 1 is a side view of a support frame 25 of a first child's safety seat secured on a vehicle seat,

Figures 2 to 4 are views similar to Figure 1 showing a seat structure mounted on the support frame in three different positions.

30 Figure 5 is a front view of the support frame of Figure 1,

Figure 6 is a sectional view of part of the seat structure and support frame of Figures 1 to 5,

Figure 7 is a side view of the child's safety seat of Figures 1 to 6 adapted for use as a pram.

Figures 8, 9 and 10 are side views of a second child's safety seat, each Figure showing the 5 seat in a different position; and

Figures 11 and 12 are exploded perspective views on a larger scale of upper and lower connectors respectively included in the child's safety seat of Figures 8 to 10.

10 Figure 1 of the drawings shows a vehicle seat 10 having a squab 12 and a backrest 14. A support frame 16 of a child's safety seat is secured to the vehicle seat by a pair of anchoring straps 18 connected to conventional safety belt anchorages (not shown) 15 of the vehicle in the region of the joint of the squab 12 and backrest 14 of the seat 10.

In a modified embodiment, each strap 18 is replaced by a pair of straps extending to the region of the join of the squab 12 and backrest 10 from spaced points on the support frame 16. The straps of 20 each pair may be connected to a further strap extending to the respective vehicle anchorage, or may extend independently to their vehicle anchorage.

The support frame 16 has first and second tubular 25 side members 17 each having a lower portion extending upwardly from the vehicle floor 20 in front of the seat 10, then upwardly and rearwardly by way of an intermediate portion 22 to an upper end portion 24 where an upper cross member 26 (see Figure 5) joins the two 30 side members 17 together. A lower cross member 27 (see Figure 5) extends between the side members 17 adjacent the upper ends of their lower portions. The lower ends of the side members 17 each have an adjustable foot 28

which is slidable within the respective side member 17 and can be adjusted so that the intermediate portion 22 is spaced above the squab 12 of the vehicle seat 10 and the upper end portions 24 and cross member 24 contact 5 the seat backrest 14 when the anchoring straps are tensioned and adjusted in length by conventional devices (not shown).

Each adjustable foot 28 may be secured to its side member 17 by a lock nut engaging a tapered external 10 screw thread on an end portion of the side members 17. The end portion also has an axial slot which is open at the end of the side member and is narrowed by rotation of the lock nut to cause the side member 17 to grip 15 the foot 28 in a selected relative position of the side member and the foot.

The intermediate portion 22 of each side member 17 is formed as an arc of a circle of radius R and each has a series of holes 30 spaced along its length, the holes in the respective intermediate portions being aligned 20 transversely. The anchoring straps 18 are secured to the intermediate portions 22 of the side members by suitable brackets 32.

Figure 2 shows a seat structure in the form of a one piece shell 34 mounted in a rearward-facing 25 position on the support frame 16. The shell 34 is moulded from a suitable plastics material and is fitted with a removable safety harness (not shown). The side members 17 of the support frame 16 are located between side walls 36 and flap portions 38 of the shell 30 which extend parallel to the side walls 36 and are spaced therefrom. At the forward edge of the squab of the shell 34, a notch 37 in an outwardly turned lip 40 of the shell 34 can also receive the side

members 17 (see Figures 2 and 4). The shell 34 is movable along the curved intermediate portions 22 of the support frame 26 on two pairs of wheels 42, one pair being attached to each side of the shell 34.

- 5 Each flap portion 38 is fitted with a spring-loaded locking bolt assembly 44 which is described in more detail below and includes a bolt 46 which can be received in a selected one of the holes 30 when the shell 34 is in a selected position on the support
- 10 frame 16.

Figures 3 and 4 show the shell 34 on the support frame 16 in two further positions in which the child's safety seat structure faces forwards and is in two different states of inclination relative to the

- 15 support frame 16.

Figure 6 shows one of the spring loaded bolt assemblies 44 of the shell 34 in more detail. The bolt 46 is shown received in an aperture 30 in the intermediate portion 22 of a side member 17 of the

- 20 support frame 16. The outer end of the bolt 46 is secured to an operating knob 48 and is slid able in an aperture 50 in the flap portion 38 of the shell 34.

A helical compression spring 52 surrounds the bolt 46 and acts between a circlip 54, located in a circumferential groove on the bolt 46, and a plate 56 apertured centrally for the bolt 46 and secured by screws 58 in a recess 60 of the flap 38. An aperture 62 in the side wall 36 of the shell 34 is aligned with the aperture 50 in the flap 38 and receives the end of the bolt 46 passing through the aperture 30 in the tubular intermediate portion 22 of the side member 17.

Figure 7 of the drawings shows the child's seat adapted for use as a pram. The adjustable feet 28

have been removed from the lower ends of the side members 17 of the support frame 16 and have been replaced by castors 64. The upper end portion 24 of each side member of the support frame 16 is secured to a tubular handle and wheel strut member 66 which extends upwardly from the upper end portion 24 of the respective side member 17 to a handle 68 and downwardly from the upper end portion 24 to a further castor 70. The tubular members 66 are detachably secured to the side members 17 by fasteners such as bolts and wing nuts 72. In Figure 7, the anchoring straps 18 have been removed from the brackets 32 and additional braces 74 pivotally attached to the tubular members 66 have been attached to the brackets 32. The pram can be used for transportation of a baby or child in the usual manner with the shell 34 mounted on the support frame 16 in either a rearward-facing position as shown in Figures 2 and 7 or a forward-facing position such as one of those shown in Figures 3 and 4. In the rearward-facing orientation, the shell can adopt a cradle-like position suitable for a baby or small child.

In a modified embodiment, the four castors 64, 70 are replaced by a front pair of wheels and a rear pair of wheels, each pair being mounted at opposite ends of an axle which carries a pair of mounting members which are insertable into the lower ends of the side members 17 and the lower ends of the strut members 66. The mounting members may be secured by tapered thread and lock nut arrangements as described above, or, for example, by ball catches on the mounting members engagable in apertures in the side or strut members 17, 66.

By way of further modification, each castor

64 or 70 is replaced by a pair of coaxially-arranged wheels mounted one to each of the respective side or strut member 17 or 66.

For use in a motor vehicle, the support frame 16 of the child's safety seat is first mounted on a seat 10 of the vehicle as shown in Figure 1. The adjustable feet 28 are adjusted until the intermediate portion is spaced from the squab 12 of the vehicle seat 10 and the anchoring straps 18 secured to the vehicle anchorage points and tensioned and adjusted in length. The shell 34 is then mounted on the support frame 16 in either a rearward-facing position such as is shown in Figure 2 or in a forward-facing position such as is shown in Figures 3 and 4. For adjustment of the inclination of the shell 34, the shell 34 moves on its wheels 42 along the intermediate portions 22 of the support frame 16 until the shell 34 is in its desired orientation. The spring-loaded locking bolts 44 are then located in the appropriate apertures 30 in the support frame 16. For mounting of the shell 34 in a forwardly facing position, the knobs 48 of the locking bolts 44 are pulled outwardly against the bias of the springs 52 and the shell 34 lifted clear of the support frame 16. The shell may then be rotated and replaced on the support frame 16 in a position such as that shown in Figure 3 or Figure 4. In this case, the locking bolts 46 again engage the apertures 30 in the intermediate portions 22 of the side members 17 of the support frame 16. When the shell 34 is in a forward-facing position, the safety harness can be fitted to the shell 34 to secure the child therein.

The support frame 16 may be left attached to the vehicle after removal of the shell 34, or alternatively, the support frame 16 can be removed by freeing of the anchoring straps 18. After removal, the seat can be used as a pram as shown in Figure 7. For this purpose, the tubular members 66 are secured to the upper end portions 24 of the side members 17 of the support frame 16 by means of the bolts and wing nuts 72 and the braces 74 attached to the brackets 32. The adjustable feet 28 are removed from the lower ends of the side members 17 and replaced by the castors 64. The shell 34 is then mounted on the intermediate portions 22 of the side members 17 of the support frame 16 in a rearward-facing position such as is shown in Figure 7 or in a forward-facing position such as one of those shown in Figures 3 and 4. In each position, adjustment of the orientation of the shell 34 is possible by operation of the locking bolts 44.

In another modification of the embodiment described above, the handles 68 are permanently attached to the upper end portion 24 of the support frame 16 and orientated so as not to interfere with the contact between the backrest 14 of the vehicle seat 10 and the support frame 16.

It will now be seen that the present invention can provide a versatile child's safety seat which can be used in a rearward-facing position for transportation of babies or very small children in a vehicle and, when fitted with a safety harness, can be used by larger children in a forward-facing position. The seat can thus be used for babies and children over a wide age

range from infancy onwards. The seat structure is rapidly and easily removable from the support frame which may be left anchored in a vehicle, or, alternatively, the support frame and seat structure 5 can be removed for conversion into a pram. When secured in the vehicle, the support frame uses two conventional safety belt anchorages and, in hatchback vehicles and estate cars, anchoring straps passing inconveniently over the back of the rear seat are 10 avoided.

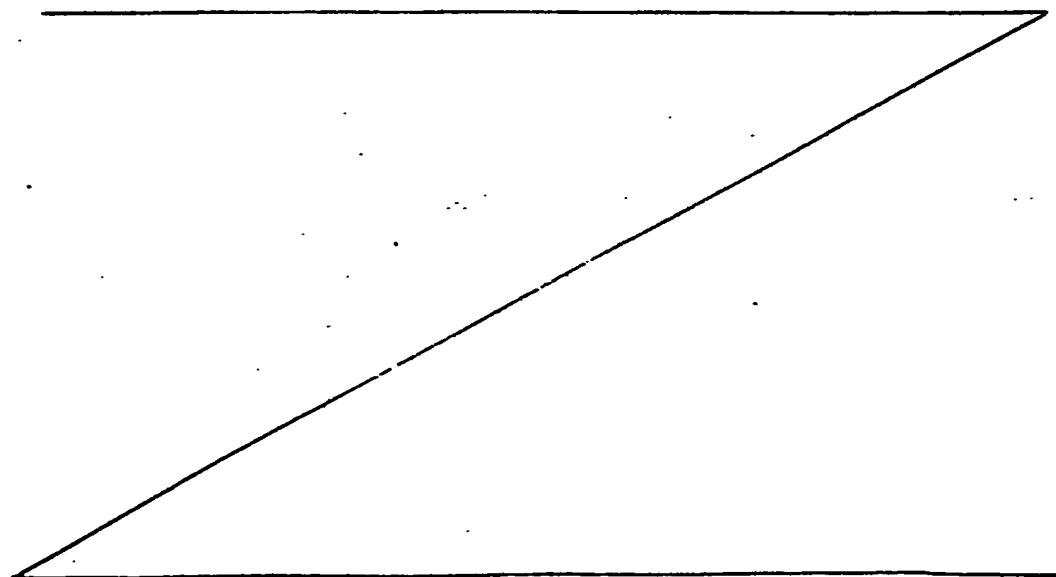
The child's safety seat shown in Figures 8 to 10 comprises a support frame 101 by means of which the safety seat can be secured to a vehicle seat in use. The support frame 101 comprises a pair of spaced tubular 15 side members of circular cross-section each having a straight base portion 102 which extends fore and aft in use on the squab of the vehicle seat and which is joined at its forward end through a curved intermediate portion with a straight rearwardly extending ramp 20 portion 104 making an angle of some 25 or 30° with the base portion. Above the rear end of the base portion 102, the ramp portion 104 joins by way of a second short curved intermediate portion with an upright portion 105 having at the upper end thereof a portion 25 106 curved rearwardly through 180° to provide a hook which can be received over the backrest of the vehicle seat. The two side members 102 are rigidly connected together by transversely extending cross members (not shown), located on the base and hooked end portions 30 only. The free ends of the side members are closed by caps 107, for example of plastics material.

It will be understood that the frame of the child's safety seat can be configured so as to be secured to

the rear of the seat in ways other than described. Any frame structure can be employed which can be securely received in place and which provides spaced side members with ramp and upright portions generally in the positions 5 illustrated.

Between the frame side members there is received a seat structure 110 in the form of a shell with side walls 111, base and rear walls 112,114 providing respectively seat and backrest surfaces within the shell, and an 10 outwardly and downwardly turned rim 115. The shell can be integrally moulded from a suitable plastics material and is fitted with a removable safety harness (not shown). The seat structure 110 is connected to the frame 101 by upper and lower connectors 120 and 121 15 located on each side wall 111 respectively in the region of the upper end and adjacent the join of base and rear walls 112,114.

As shown in Figure 11 each upper connector 120 comprises inner and outer discs 122,124 formed with 20 opposed diametrical grooves of semi-circular cross-



section within which the side member upright portion 105 is slidably received. The inner and outer discs.

122,124 are secured together by bolts (not shown) extending through holes in the outer disc into tapped recesses in the inner disc.

5 A shaft portion 127 extends axially from the inner disc 122 through an aperture in the seat structure side wall 111 defined by an integrally formed outwardly extending bush portion 129 of a length sufficient to space the upright portion 105 away from the rim 115 of the seat structure. The free end of the shaft portion 127 is provided with a peripheral groove 130 at a position inwardly of the seat structure side wall and the connector 120 is freely rotatably retained in place by a circlip 131 received in this groove.

10 The side member upright portion 105 is provided with a series of spaced apertures 132 extending transversely therethrough, and the connector 120 is secured to the upright portion at the position of any selected one of these apertures by the shank 135 of a securing pin 136 which is received in a bore 137 in the outer disc 124 and an aligned recess 139 in the inner disc 122. The securing pin has a head provided with a transverse ridge 140 to facilitate manipulation and with an external screw thread 141, preferably of the quick start type, which can engage with an internal screw thread 142 formed in a central recess at the outer side of the outer disc 124.

15 The connector 120 could be modified by replacement of the securing pin 136 by a spring-loaded plunger. The seat structure 110 can in fact be connected to the frame 101 by a variety of means other than the connectors described. For example, each frame side member can be frictionally gripped by a manually operated clamp, so that infinite adjustability is obtained, and the clamping or securing means need not necessarily be

associated with the means by which the frame and the seat structure are slidably connected.

The connectors 121 connecting the seat structure to the inclined or ramp portions 104 of the frame side members 101 closely resemble the connectors 120, as will appear from Figure 12, and corresponding parts are indicated by the same reference numerals. The connectors 121 are secured to the side walls 111 in the same way as the connectors 120 but merely make a rotatable slide fit on the ramp portions 104 and have no securement means corresponding to the pin 136. The outer face of the outer disc 124 is provided with a marking 145, in the form of an arrow in the embodiment shown, to indicate that this fitting is a slide fitting and does not require to be manipulated when the position of the seat structure is to be changed. The axial bore 137 and the recess 139 of the inner and outer discs 122,124 can be omitted but to save the manufacture of separate parts, the connector 121 can be identical to the connector 120 except that the securement pin 136 is replaced by a screw-threaded plug carrying the marking 145.

Returning to Figure 8, this shows the child's seat in its extreme upright position, in which the seat surface of the seat structure 110 is approximately horizontal, or parallel to the base portions 102 of the frame side members, and the backrest surface is approximately vertical, or parallel to the side member upright portions 105. The seat surface is spaced substantially above the base portions 102, so that a child occupying the seat is placed fairly high in the vehicle and can see outside it through the adjacent windows.

When it is desired to tilt the seat structure into a more reclined position, for example that of Figure 9, the upper connectors 120 are manually released and are

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5 moved downwardly on the upright portions 105 until the securement pins can enter through a lower one of the holes 132, corresponding to a desired inclination of the seat structure seat and back surfaces. The lower connectors slide forwardly and downwardly on the ramp portions 104, the seat structure being automatically lowered.

10 The process can be carried further to the extreme reclined position shown in Figure 10 in which the seat structure seat and back surfaces are making approximately equal angles of inclination to the horizontal, and the seat structure is at its lowest position, providing greater comfort for the occupant and facilitating placement and removal by an adult.

15 It will be noted that the precise shape of the frame side members 101, because the seat structure 110 is attached to each side member at two points only, is not critical for satisfactory ease of adjustment of the seat structure. Manufacturing 20 tolerances can therefore be easily accommodated and small distortions occurring in use are not detrimental.

It will also be evident that the invention can be embodied in a variety of ways other than as described and illustrated.

CLAIMS

1. A child's safety seat comprising a seat structure, preferably a one-piece shell (34), means (16) for supporting the seat structure in a vehicle, and means (18) for securing the safety seat in the vehicle; characterised in that the support means are shaped such that, when the safety seat is secured in the vehicle, first and second spaced-apart end portions (24, 28) of the support means contact respectively the backrest of a seat of the vehicle and the vehicle floor adjacent the seat, the seat structure being mountable, preferably adjustably, on an intermediate portion (22) of the support means which lies between the end portions and, when the safety seat is secured in a vehicle, extends over the squab of the vehicle seat.
- 15 2. A child's safety seat according to claim 1, characterised in that the seat structure (34) is adjustably mountable on the intermediate portion (22) and its position relative to the support means is selectively adjustable between positions which include a forward-facing position and a rearward-facing position and/or is selectively adjustable between positions which include a reclined position and a more upright position.
- 20 3. A child's safety seat according to claim 2, characterised in that the intermediate portion (22) of the support means (16) is inclined upwardly in the direction towards the second end portion, preferably on a curved path, when the safety seat is secured in a vehicle.
- 25 4. A child's safety seat according to claim 2 or 3, characterised in that the seat structure (34) is movable along the intermediate portion (22) for adjustment of its position relative thereto, the safety seat including means (30, 44) for securing the seat

structure to the support means at a selected position relative thereto.

5. A child's safety seat according to claim 4, characterised in that the seat structure (34) is supported on the intermediate portion (22) on rotary elements (42) which are preferably rotatably-mounted on the seat structure and more preferably comprise wheels.

10 6. A child's safety seat according to claim 4 or 5, characterised in that the seat structure securing means (30, 44) allow for securing of the seat structure (34) at a selected one of a plurality of relative positions of the seat structure and the support means (16).

15 7. A child's safety seat according to any preceding claim, characterised in that the support means comprise first and second laterally-spaced side members (17) which are engageable with respective opposite sides of the seat structure (34) and which 20 are joined by one or more transverse members (26, 27).

8. A child's safety seat according to claim 7 when dependent on claim 6, characterised in that the seat structure securing means comprise a respective spring-loaded bolt (46) at each side of the seat 25 structure (34), the bolts being receivable in a selected pair of a series of pairs of apertures (30), the apertures of each pair being in respective different side members (17).

9. A child's safety seat according to claim 30 7 or 8, characterised in that each side member (17) has at one of its ends a member (28) which is adjustably extensible from the side member, the adjustable members constituting the second support means end portion.

10. A child's safety seat according to any 35 one of claims 7 to 9, characterised in that the side

members (17) have adjacent their ends constituting the second support means end portion respective energy-absorbing elements.

11. A child's safety seat comprising a
5 seat structure, preferably a one-piece shell (34),
means (16) for supporting the seat structure in a
vehicle, and means (18) for securing the safety seat
in a vehicle, characterised by a plurality of rotary
elements (64, 70), preferably comprising wheels, having
10 means (66, 72, 74) for removable attachment to the
support means or seat structure for formation of a
pram and, preferably, also by handle means (68) for
removable attachment to the support means or seat
structure.

15 12. A child's safety seat according to
any one of claims 1 to 10, characterised by a plurality
of rotary elements (64, 70), preferably comprising
wheels, having means (66, 72, 74) for removable
attachment to the support means (16) for conversion
20 of the safety seat into a pram and, preferably, also
by handle means (68) for removable attachment to the
support means.

13. A child's safety seat according to
claim 12, characterised in that first (66) and second
25 removable attachment means of the rotary elements
are removably attachable to the support means (16)
adjacent the first and second end portions (24, 28)
thereof to provide, respectively, rear (64) and front
(70) rotary elements of the pram.

30 14. A child's safety seat according to
claim 13, characterised in that the first removable
attachment means comprise respective lateral struts
(66) each extending downwardly from the first end

portion (24) to the rear rotary element(s) (64) and upwardly from the first end portion to handle means (68) of the pram.

15. A child's safety seat comprising a
5 seat structure, preferably a one-piece shell (34),
means (16) for supporting the seat structure in a
vehicle, and means (18) for securing the safety seat
in the vehicle, characterised in that the seat structure
is mountable on the support means in first and second
10 alternative positions in which the seat structure
is in forwardly- and rearwardly-facing positions.

16. A child's safety seat comprising a
seat structure, preferably a one-piece shell (110),
a support frame (101) for supporting the seat structure
15 in a vehicle, the support frame comprising front
and second spaced-apart side portions (102, 104, 105)
on which the seat structure is supported for movement
thereon between an upright and an inclined position,
means for securing the safety seat in the vehicle,
20 and means (120) for securing the seat structure to
the frame at a selected relative position of the
structure and frame, characterised in that the seat
structure has two attachment points only (120, 121)
with each frame side portion.

25 17. A child's safety seat according to
claim 16, characterised in that the securing means
are located at at least one (120) of the attachment
points.

18. A child's safety seat according to
30 claim 16 or 17, characterised in that each frame side
portion has a lower, preferably rectilinear, forwardly-
and downwardly-inclined ramp portion (104) and an
upper, preferably rectilinear, upright portion (105),

each attachment point lying on a different one of the lower and upper frame portions.

19. A child's safety seat according to claim 18, characterised in that each frame side portion has upper and lower free ends (107), the upper free end preferably forming the free end of a looped portion (106) for reception over the upper edge of a vehicle seat backrest and the lower free end preferably forming a free end of a side frame portion (102) intended for contact with a vehicle seat squab and extending beneath a respective one of the ramp portions.

20. A child's safety seat according to any one of claims 16 to 19, characterised in that the securing means comprise at least one guide element on the seat structure (110) and having a bore in which a frame side portion (105) is slidably received and a securing element (136) having a stem (135) which is receivable in a selected one of a plurality of apertures (132) in the frame side portion and which can be inserted into and secured in a socket (137, 139) opening laterally into the bore in such a way that the stem is received in an aperture aligned with the socket and the seat structure is thus secured to the frame.

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FIG. 1.

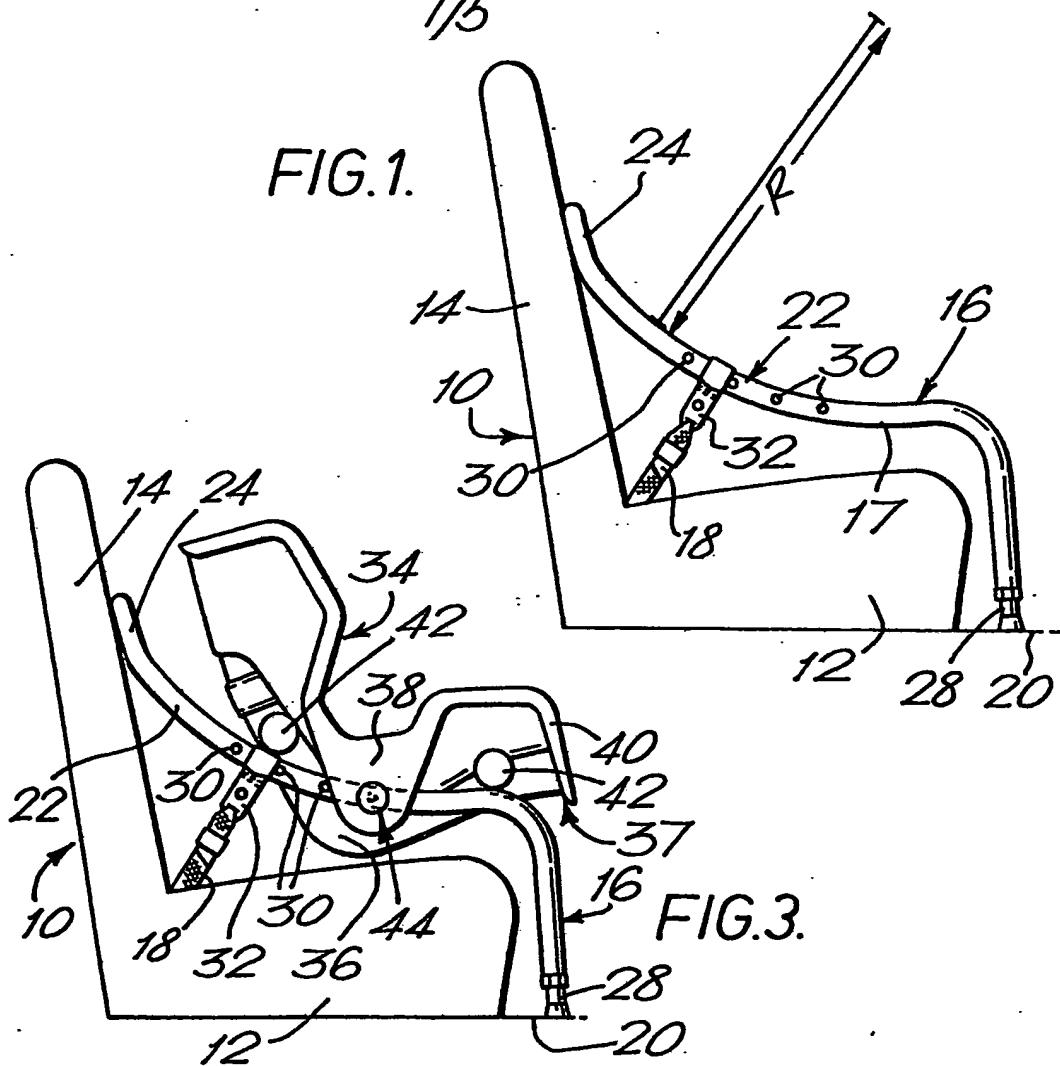
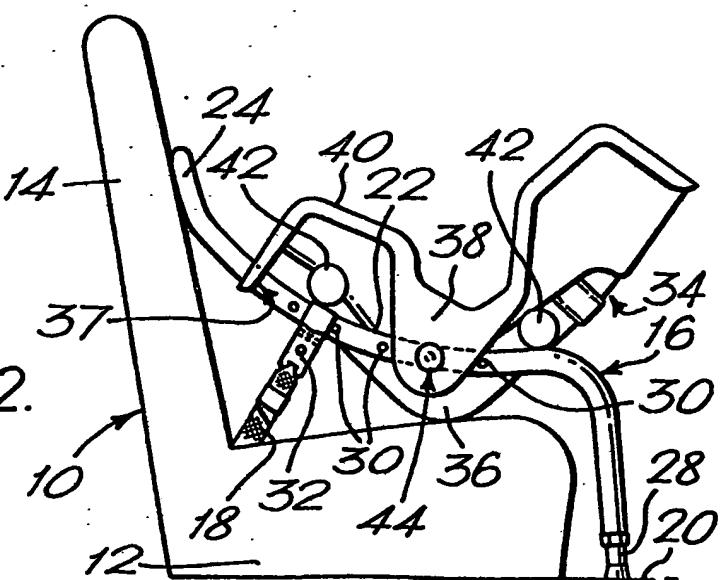


FIG. 3.

FIG. 2.



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FIG.4.

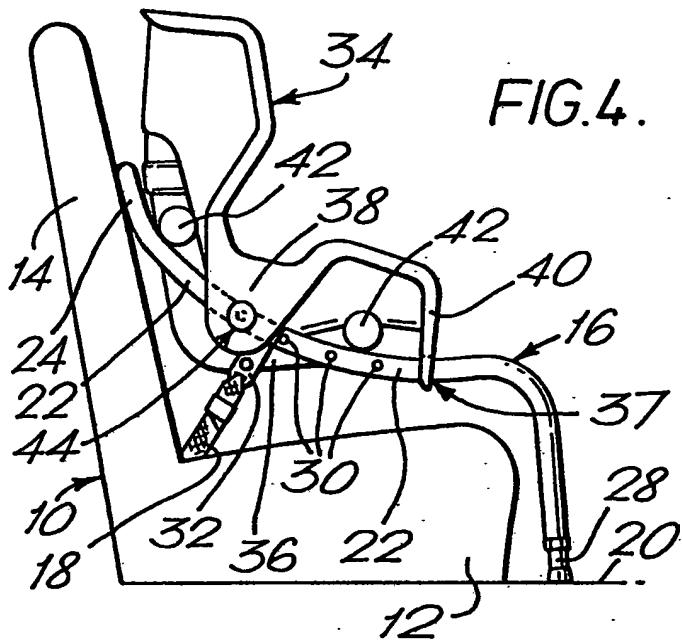


FIG.5.

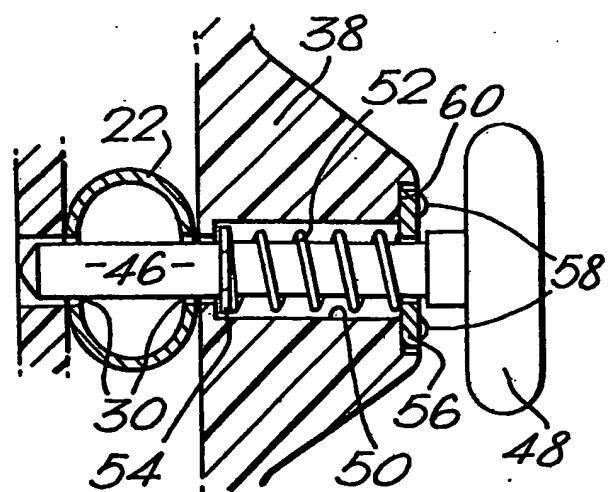
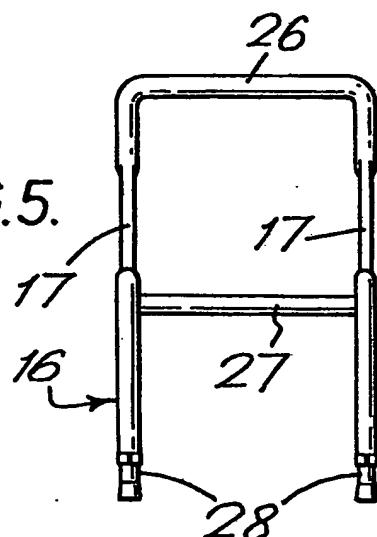
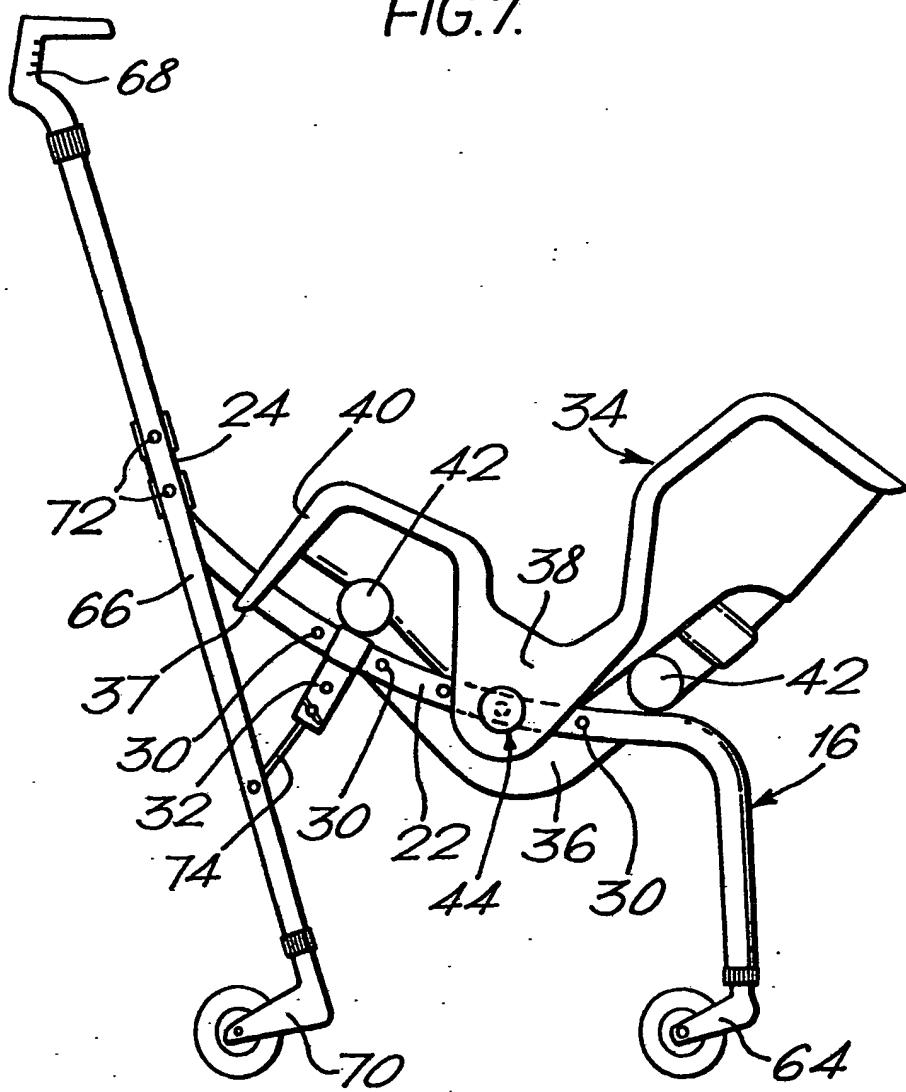


FIG.6.

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FIG. 7.



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FIG.8.

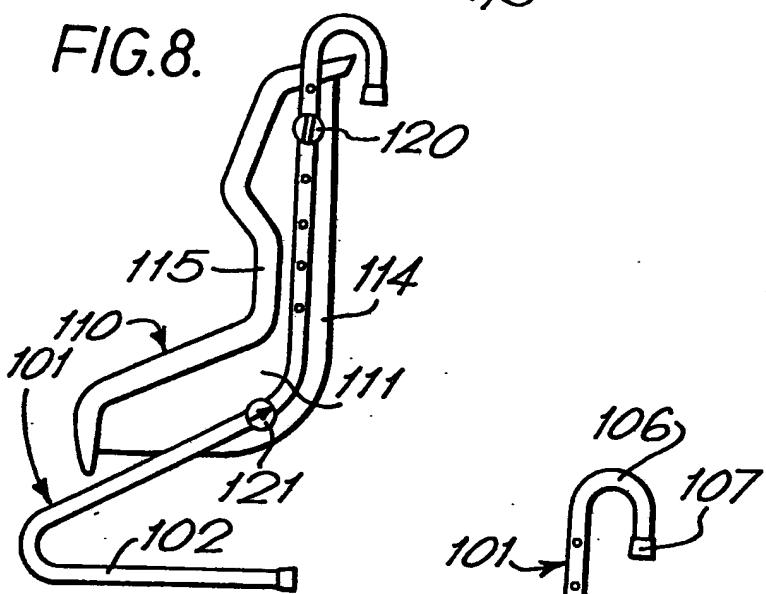


FIG.9.

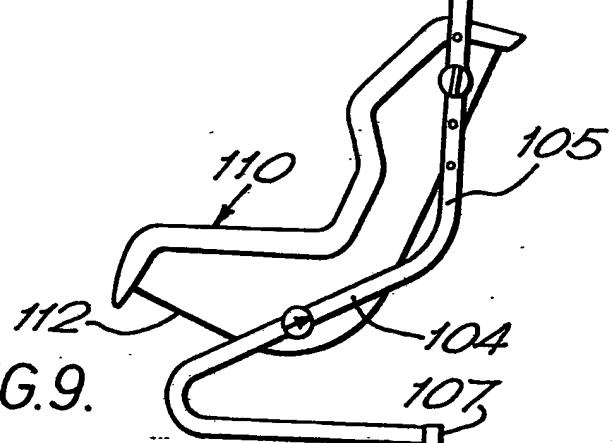
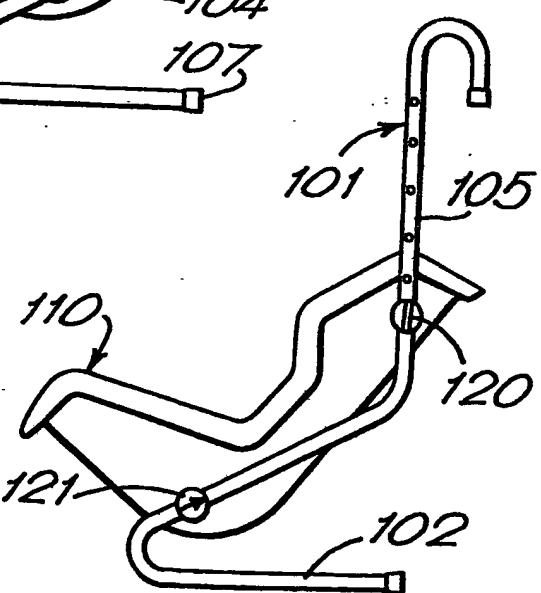


FIG.10.



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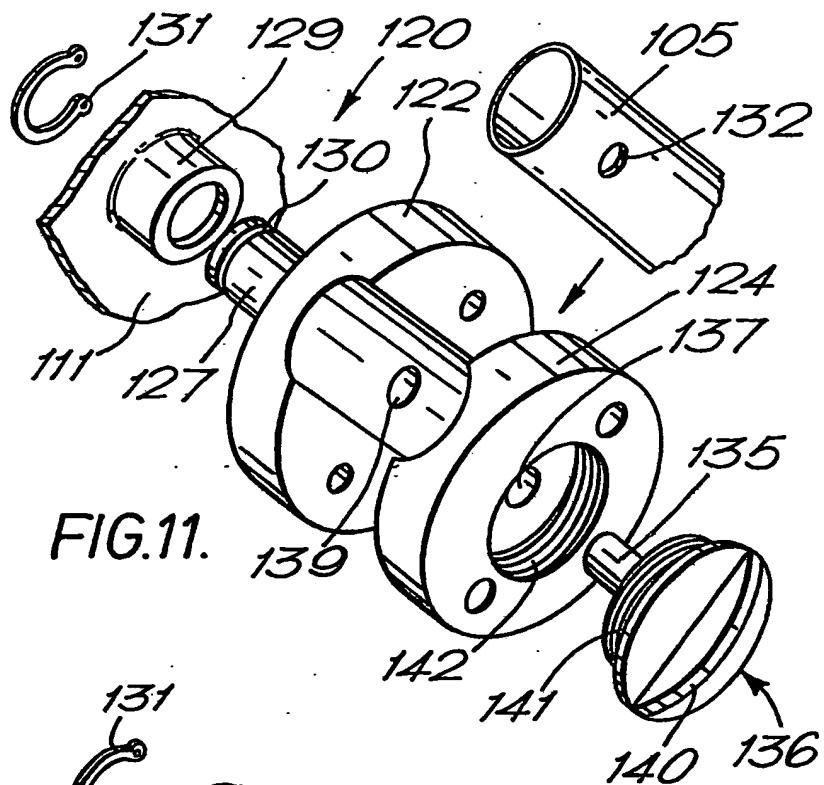


FIG.11.

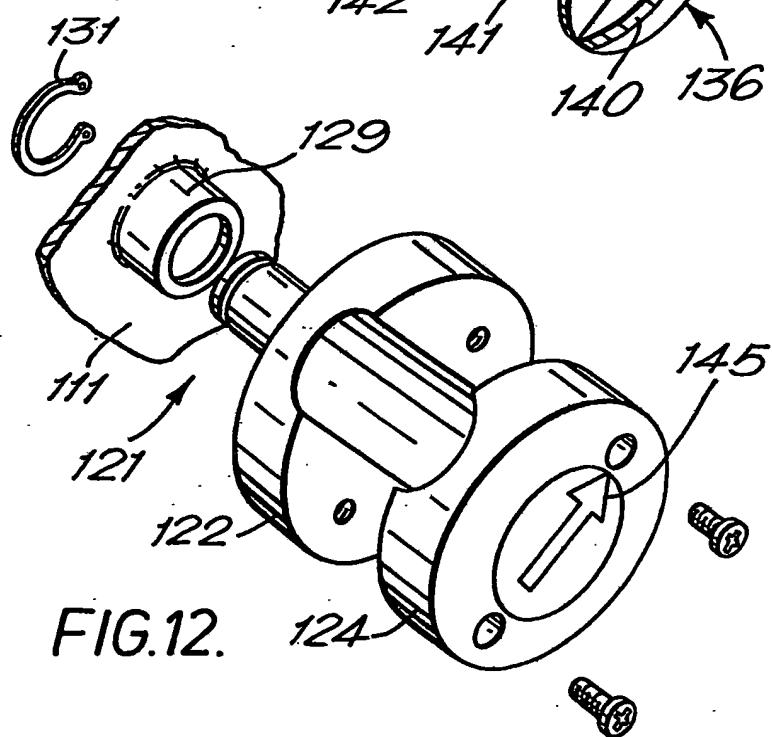


FIG.12.